PART A – COVER PAGE

STATE WATER RESOURCES CONTROL BOARD
SFY 2002 Costa-Machado Water Act of 2000
CALFED Watershed Program

Application No. 595

PROJECT TITLE: Plymouth Area Vineyard Erosion Control

Project Region X Indicate RWQCB #: 5

Multi-regional Project _____ Indicate RWQCB #s: _____

Statewide Project _____

PROJECT DIRECTOR (one name only) (Ms., Mr., Dr.): Mr Ray Ryan

PRINT DATE

LEAD APPLICANT OR ORGANIZATION: Amador County Wine Grape Growers Association

TYPE OF AGENCY:

Municipality _____ Local Agency _____ *Nonprofit (non-landowner) X

Nonprofit (landowner) _____ Local Public Agency _____

STREET ADDRESS: 10580 Dickson Road
CITY: Plymouth Zip Code: 95669
P.O. BOX: PO Box 718 Zip Code: 95669
COUNTY: Amador
STATE: California

PHONE NO.: 209 245 4910 FAX NO.: 209 245-3036

E-MAIL ADDRESS: Rayr7755@aol.com FEDERAL TAX ID. NO.: 68-0371157

PROJECT TYPE: Prevention of soil erosion and sediment transport (79080c(6)), water quality monitoring (79080c(4))

LEGISLATIVE INFORMATION

Senate District 1 Assembly District 4

United States Congressional District 4

CALFED, RWQCB, or SWRCB STAFF CONTACTED REGARDING THIS PROPOSAL:

Contact:	Kelly Briggs	Contact:	Rod Johnson
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Dates contacted:	June 6		

PRIMARY COOPERATING ENTITIES:

Entity Name:	California Association of Winegrape Growers (CAWG)		
Role/Contribution to Project:	Contributing Sustainability assessment		
Contact Person:	Cliff Ohmart	Phone No.:	
E-mail address:	Cohmart@aol.com		
Entity Name:	University of California Cooperative Extension, Amador and El Dorado County		
Role/Contribution to Project:	Provide advise on erosion control strategies and support in outreach		
Contact Person:	Donna Hirschfelt	Phone No.:	(209) 223-6482
E-mail address:	djhirschfelt@ucdavis.edu		

WATERBODY/WATERSHED (Include Catalog Number in Section 18 of the ARD): Upper Cosumnes Watershed Cat No. 18040013

GPS COORDINATES FOR PROJECT LOCATION, IF AVAILABLE: _____

FISCAL SUMMARY:

Proposition 13 Funds Requested	$500,000
Other Project Funds	$
Total Project Budget	$500,000

CERTIFICATION

Please read before signing.

I certify under penalty of perjury that the information I have entered on this application is true and complete to the best of my knowledge and that I am entitled to submit the application on behalf of the applicant (if the applicant is an entity/organization). I further understand that any false, incomplete, or incorrect statements may result in the disqualification of this application. By signing this application, I waive any and all rights to privacy and confidentiality of the proposal on behalf of the applicant, to the extent provided in this RFP.

_____

Applicant Signature Date

_____

Printed Name of Applicant

PART B – PROJECT NARRATIVE

Project Overview

The City of Plymouth, in Amador County, CA is located within the Upper Cosumnes Watershed District, which is identified as a priority watershed (18040013). The rural areas surrounding Plymouth, in Amador County, California, have experienced increasing conversion to vineyards in recent years. As easier to farm bottom lands are already in production, the trend here, as with other grape growing areas, is to convert steeper slopes into wine grape production. These highly volcanic-soiled slopes in the project area are within the drainage basins of Pigeon Creek, and Big Indian Creek both of which are tributaries to the Cosumnes River. In addition, the City of Plymouth plans to create a drinking water reservoir on Big Indian Creek, after the Pigeon Creek influence. Thus, the water quality of Big Indian Creek, and Pigeon Creek will influence the water quality of this reservoir that will serve the City of Plymouth.

While some wine-grape growers of this region have voluntarily implemented erosion control strategies on their farms, very little, if any, monitoring has been done to evaluate the efficacy of these strategies in this area. There is also very little data on the contribution of these vineyards to the nutrient and sediment loads of Pigeon and Big Indian Creeks and the smaller creeks in the area, and on the water quality of Big Indian and Pigeon Creeks in general. In addition, there is little information regarding the impact of vineyard development on the shallow groundwater of this area, which may also flow to the Cosumnes River, or into the creeks and potential reservoir.

With this year's repeal of agricultural exemptions from pollution controls, including runoff and erosion, greater focus will be placed on the best strategies for controlling runoff and preventing pollution from entering water bodies. Furthermore, wineries of the Foothills have been specifically targeted for greater scrutiny regarding their wastewater, an action that has lead to many recent regulatory interferences in their operations. Allowing grape growers to select and investigate the erosion control measures of their choice will promote more timely, and more willing implementation of runoff and erosion control measures in the future and promote proactive solutions to environmental concerns.

The purpose of this project is to protect the water quality of Pigeon Creek, Big Indian Creek, other smaller creeks in the area and the shallow ground water of the area, all part of the Cosumnes River watershed. The project will make use of rainfall simulation to assess the potential for erosion and associated sediment, nutrient and pesticide residue transport from fields. Shallow groundwater monitoring will be used to assess the value of erosion control strategies in protecting shallow groundwater, which in some sites may be hydrologically connected to the creeks in the area. Stream water quality and stage monitoring will be used to assess the current contributions of vineyard and non-vineyard erosion to stream water quality, and the effects of the erosion control measures in controlling negative impact, and influencing peak flows of Pigeon Creek, Big Indian Creek and associated smaller creeks within the area (including the Plymouth Ditch). Three or four erosion control strategies will be selected by the group of participants, and will be implemented at 12 to 15 locations in the study area. The relative erosion potential and influence on shallow groundwater quality for each strategy will be assessed through rainfall simulation and up- and down-stream monitoring. An education and outreach component will be included that demonstrates the need for and efficacy of erosion control measures in the area. Finally, in

conjunction with the California Association of Winegrape Growers (CAWG), sustainability assessment workshops will be held for growers in Amador County.

Rationale

The "traditional" approach to vineyard management has been to maintain clean soil between rows of grapes. On relatively flat land this practice may not result in soils loss and sediment runoff, although it may influence shallow groundwater quality. However, as slopes increase, the potential for reduced infiltration , and increased rainfall runoff and erosion increases. Erosion in new hillside vineyards in the Napa area has been quite evident in recent years. Notably, in 1989 the newly cleared vineyard above Bell Canyon Reservoir badly eroded during fall rains resulting in sedimentation of the reservoir, a municipal water supply. This type of situation may be avoided in the Plymouth area with better understanding of the erosive capacity of these sloped vineyards, and implementation of proactive erosion control. Additionally, the control of non-point pollution sources, such as agricultural runoff, to tributary waterways such as Big Indian and Pigeon Creeks is an important component in the protection of larger rivers such as the Cosumnes River.

The most comprehensive information regarding vineyard erosion potential and options for reducing erosion is from Europe, France and Italy in particular. In these countries chemically weeded inter-rows show the highest rates of runoff and erosion while grass and weed covered, or cover cropping inter-rows show the least amount of runoff and erosion (Messer, 1980, Tropeano, 1983).

Rainfall simulation has been used to demonstrate the amount of runoff and erosion from sloped vineyards in France, and in Napa. In France the approach was used to determine the relative runoff and erosion potential from grass, mulch, compost grape pomace, wood bark and sawdust covered inter-rows, and bare inter-rows (Gril, et al, 1989). In Napa, rainfall simulation was demonstrated to be effective at estimating runoff and erosion potential, and was found to be amenable to scaling up one to two orders of magnitude to be applied at field scale (Battany and Grismer, 2000a). Thus, rainfall simulation, due to the relative convenience of use (there is no need to wait for natural rainfall events), and possibility for replication, is the method selected for determining and comparing runoff and erosion potential for this project.

Shallow groundwater quality is also influenced by the implementation of vegetative erosion control measures. Watanabe and Grismer (2001) demonstrated degradation of diazanon through the use of inter-row vegetated "filter strips". As runoff containing diazanon residues percolated through the vegetated strips the concentration of diazanon was reduced and further analysis proved degradation of the compound.

The highly fractionate bedrock of the region provides potential for hydrologic connection between shallow groundwater and nearby creeks and streams. Therefore, demonstrating the mitigating influence of vegetative cover between rows of grapes on shallow groundwater is considered an important element of this project.

The selection of specific erosion control strategies used in the project will be determined by the participating growers after a preliminary workshop on erosion control. The workshop will be led by experts in the field of vineyard erosion control including advisors Mark Battany and/or Donna Hirschfelt of U.C. Cooperative Extension, Mark Grismer of U.C. Davis, NRCS staff from Napa, and/or staff from the Central Coast Vineyard Team. It is generally thought, and one of the missives of the CALFED Watershed protection project is that local initiative will result in greater

project effectiveness. We will therefore promote education of participants, followed by participant involvement supported by cooperative extension advisors. Therefore, the ACWWGA will not select the specific erosion control strategies, but will instead provide information such that individuals can make informed choices. The information obtained from the monitoring aspect of this project will thus contribute to the information required to make informed choices for other growers in Amador County. Additional information will be provided by the sustainability assessment workshops, contributed by the CAWG.

Project Location

The project area is the Shenandoah Valley in the City of Plymouth, in Amador County California. Specifically, the project area is bound in the North by the divide between the South fork of the Cosumnes River and Pigeon Creek. The area is bound to the South by the ridgeline contributing to Big Indian Creek. The Eastern area boundary is Ostrom Road, and the Western boundary is Highway 49. The study area boundaries are shown on Project Location Map, section E.

Project Description

This project will investigate the potential for vineyard erosion in the Shenandoah Valley and adjacent areas, the contribution of this erosion to water quality in Pigeon and Big Indian Creeks, other smaller creeks and the shallow groundwater in the area, and the efficacy of several erosion control measures to reduce vineyard erosion. The project will also provide the public with information regarding the project and its results, as well as the importance of watershed protection to community health. The project thus consists of the following elements:

- Site assessments (Site manager/owner interviews, soil testing, assessment of erosion potential, survey)
- Workshops (erosion impacts and control strategies, sustainability assessments)
- Shallow groundwater monitoring
- Stream monitoring
- Implementation of erosion control strategies
- Outreach

Site selection and assessments

Grape growers in the project location will be asked to volunteer for project participation. From those that volunteer, twelve to fifteen one-acre vineyard sites will be selected. In addition, for comparative purposes, and to include the greater community, agricultural land users other than grape growers will also be invited to participate. From those that volunteer, four to six non-grape sites will be selected. The non-vineyard sites will include land used for other agricultural activities, and land left in a non-developed state. Site selection criteria will include proximity to creeks, slopes greater than 10%, and minimal side slope. Some shallower sloped areas may be included for comparative purposes. In addition, care will be taken to include sites on which erosion control strategies have been implemented for several years, and sites on which erosion control measures have not been implemented. Each site will be also be surveyed to confirm slope and location.

The site owners and/or managers will be interviewed as to the use of fertilizers, pesticides, including sulfur or other field amendments, and management strategies used. If soil tests are available for the sites, we will use that information. Otherwise, the soil tests will be conducted to determine soil type, a significant factor in erosion potential. The sites will also be surveyed to determine the slope and aspect. This information will be used with the information found in the initial erosion potential tests to determine correlation with erosion data from other geographical areas, thus adding to the bank of knowledge and information available on vineyard erosion.

Once the sites are selected, all locations will be tested for erosion potential using rainfall simulation and runoff collection. The rainfall simulator consists of a tower about 3 meters tall and one meter square. A platform is located at the top of the rainfall simulator that contains a water reservoir and a plate fitted with 900 hundred hypodermic needles through which the "raindrops" are formed. This rainfall simulator falls into the category known as "drop former", where the energy of the "drops" more closely matches that of natural rainfall than the "spray nozzle" types, thus allowing for better evaluation of erosion and runoff potential (Battany and Grismer, 2000b). A constant head is maintained in the upper reservoir with water pumped from a supply on the ground. The water used for the simulation will simulate local rainfall chemistry. The solution will likely contain distilled water modified with NH_4NO_3, $CaSO_4$ and NaCl. The final composition will depend on any rain chemistry data that can be obtained for the area. Below the tower is a flume to collect run-off, which is collected into sample-bottles for analysis. Small rainfall simulators such as this are well suited to a wide range of field studies, especially where access is challenging, such as in steeper sloped vineyards.

Constituents to be analyzed include sediment (total solids, settlable solids, suspended solids, volatile solids), nitrogen (Total Nitrogen, Nitrate), Phosphorous (Total phosphorous and Phosphate), Sulfur (Total Sulfur and sulfate), Total Organic Carbon, and pesticide residues. Depth of infiltration will be also measured. Several "rainfall" durations may be selected. We anticipate using a fifteen-minute or thirty-minute rainfall (simulating the fifteen-minute, or 30-minute 100-year storm) unless site conditions dictate otherwise. At least four locations within each study site will be tested.

Soil cores will be taken before and after each test to determine changes in saturated water content and bulk density within and between sites. Infiltration rates will also be calculated based on the difference between measured rainfall rate and measured runoff rate. Because tests are conducted over 15 to 30 minute periods, evaporation is minimal.

Workshops

Preliminary Workshop(s)

Prior to selection and implementation of erosion control strategies, at least one (more if needed) workshop on erosion processes, impacts and control strategies will be conducted. The purpose of this preliminary workshop is to provide information to the community as a whole, and in particular to project participants so that they may have a voice in the details of the project. The goal of the workshop(s) is to select which erosion control strategies will be used, and to determine the sighting for each. The workshops will be led by a small committee within the ACWGGA in concert with U.C. Cooperative Extension advisors and faculty to provide sound information on erosion control strategies for the area. Additional experts from the Napa Valley NRCS and the Central Coast Vineyard Team may also be brought in to provide further expertise.

Sustainability Assessment Workshops

Sustainability self-assessment workshops have been successfully utilized in the Lodi-Woodbridge area, supported in part by the California Winegrape Growers Association (CAWG). This group has agreed to conduct sustainability workshops in Amador County during the beginning stages of the project and throughout the duration of the project. The workshops will be conducted by the CAWG, and the details of these workshops are best described by the CAWG in the proposition 13 grant proposal that they have submitted. The self-assessments will provide local grape growers with knowledge about their management practices, and what measures they might consider to move towards more sustainable, and less environmentally damaging management practices, including erosion control methods.

Ongoing workshops

Throughout the project workshops will be held biannually to provide continuing education, and a forum for discussing project concerns. Project participants may share their experiences within the workshops, and receive assistance on options to alleviate any concerns, allowing for adaptive management throughout the project.

Shallow groundwater monitoring

Implementation of erosion control measures influences water quality in shallow aquifers as the increased biomass provides greater opportunity for breakdown of organic constituents and better utilization of residual nutrients. Thus, shallow groundwater monitoring wells will be installed up- and down-stream from each of the study sites. A geologist or hydrogeologist familiar with the local groundwater patterns will be consulted as to the exact locations for these monitoring wells. Efforts will be made to provide monitoring along a hydrologic gradient in each of the sites. However, the local geology consists of highly fractionated bedrock and it is therefore difficult to establish gradients. It is nonetheless considered valuable to this study to obtain information about the impact of erosion control on shallow groundwater because erosion control measures increase infiltration, and vegetative strategies also improve natural degradation in the soil (Watanabe and Grismer, 2001). The constituents to be monitored include nutrients (total nitrogen, nitrate, phosphorous), dissolved oxygen, TS, TDS, pH, and TOC.

Stream monitoring

Prior to implementation of the erosion control measures, stream flow and water quality measurements will be taken upstream and downstream from the study sites during storm events. At least two storm events will be monitored before erosion control measures are implemented. Water quality grab samples will be taken prior to the rise in stage, during peak flow and after the peak flow has subsided. Staff gauges will be installed just above and below the project area to determine peak flows. Stream monitoring may take place prior to the baseline studies, depending on the actual start date of the project in relation to the rainy season.

After erosion control implementation, two storm events will be monitored as described above to determine what, if any, changes in impact to these creeks can be observed.

Water quality constituents to be monitored include nutrients (total nitrogen, nitrate, phosphorous), dissolved oxygen, TS, TDS, pH, and TOC.

Selection and implementation of erosion control strategies

Once baseline conditions have been established, sites will be selected for installation of erosion control measures. The treatment options will be presented at the workshops and will likely include 1. no treatment; 2. "natural" vegetation allowed to grow between rows; 3. use of a specifically selected erosion control seeding mixture; 4. use of pre-vegetated mats; and 5. use of straw wattles. Project participants will discuss and select the treatments to be used. Emphasis will be placed on implementing at least three replicates of each treatment selected. Erosion control measures will not be implemented on the non-vineyard sites as these will be maintained for comparison.

After allowing time for the erosion control measures to become established, infield rainfall simulation and collection will be conducted as described above. The same test locations within the study sites will be tested, and the same constituents will be analyzed.

Outreach and follow-up workshops

Public outreach and education will have several components including:

- Public informational meetings (one per year). These meeting will be presented with the intent of educating the general public about the need for watershed protection, the effects of various land use practices on watershed functions (such as urbanization, clearing vegetation, creating ponds, and other activities typical in this area), and the role of erosion control in watershed protection. These meetings will be free of charge and advertised through the local newspapers, word of mouth and fliers.
- Demonstrations to school children (one per year). These presentation/demonstrations will have the same goals as the meetings for the general public, with the information geared to a younger audience. Contacts will be made with local teachers with the hope that at least one will be interested in supporting the project through having presentation made in the classroom. If feasible, field trips may be included to the vineyards implementing erosion control, and to a site in which erosion is evident.
- Sharing information with local groups including CAWG, the Foothill Conservancy (located in River Pines), the Natural Resources Conservation Service in Amador County, the Cosumnes River Task Force, the Mokelumne River Watershed group, the Cosumnes Conservancy and the Mokelumne Cosumnes Watershed Alliance (ongoing).
- Participant workshops (biannually). The purpose of these workshops is to provide a forum for continuing education and sharing of experiences. Ultimately, a summary pamphlet will be created out of these workshops that includes efficacy of each erosion control strategy implemented, ease of management, costs associated with each and general satisfaction. The pamphlet will become available for use by others in the area.
- Local newspaper releases, contributions to lay publications such as "Small Flows" and Ag Alert and at least one peer reviewed journal article.

We will work closely with the Farm Bureau and Cooperative Extension to provide information for other grape growers in the region through workshops and field days (El Dorado County, the rest of Amador County and Calaveras County). Finally, we will work closely with the CAWG to encourage sustainable grape growing practices, and to share the information obtained with them.

CALFED Program objectives

This project addresses the "overarching goal" of the Watershed program by involving community members in protecting the health of their local water supply, and waters of their watershed. It also provides education as to the function and health of the larger watershed, that of the Cosumnes River. The project will directly improve the surface water quality of the area by reducing erosion and runoff. This will in turn reduce sediment loads from entering the Cosumnes River. It will also provide information to further reduce erosion and runoff in the surrounding areas, and will provide information on the impact that erosion control measures have on shallow groundwater, which is not usually the focus of erosion control, but may have subsurface links to surrounding creeks. The project will also integrate a local organization (the ACWGGA) with the local water agency (the Amador Water Agency), the County government and the local RCD. The program provides further development of a watershed monitoring tool, the rainfall simulator, with further development of an appropriate protocol for use. The project provides education and outreach for project participants and the community as a whole. Finally, the project leaders will share information and integrate this information with the existing watershed groups for the system including the Cosumnes River Task Force and others listed in the text above.

Community involvement

This project is supported by the Amador Water Agency, U.C. Cooperative Extension, the County Board of Supervisors and the Farm Bureau. As such, the project will involve a number of individuals personally connected with the project area. Furthermore, the project has been initiated by community members: the members of the ACWGGA are community members, and often employ other members of the community. The efforts of this group are influential to the community as a whole. In addition, the project will seek to involve concerned members of the community through outreach activities such as the public workshops.

Watershed context

The Cosumnes River Task Force is embarking on a project using aerial photography to identify areas within the Cosumnes River Watershed that are susceptible to and experience erosion. Because of the large scale of their efforts the CRTF will not be conducting ground truthing. This project will therefore contribute to the efforts of the CRTF and we have agreed to share information as it becomes available.

There have not been many watershed projects conducted in the Upper Cosumnes River Watershed. Those projects have been conducted do not involve erosion control. Because of the impact of upland activities on downstream water quality, protecting the upper watershed will contribute significantly to protecting the lower watershed. With the efforts put into Cosumnes River conservation activities more effort should be placed on protecting the water quality of the Upper Cosumnes River. This project is directed towards that effort.

Additionally, this project addresses the following Non-Point Source projects for Region 5: R5-2: This project implements erosion control plans using BMPS (in part) from other areas to reduce NPS pollution from agricultural land and monitors the activities to demonstrate efficacy of these practices; R5-8: This project encourages citizen monitoring where possible and community education and K-12 watershed education through community workshop and school group demonstrations; R 5-17: This project improves upland conditions to result in improved water quality in downstream areas; and R5-19: This project addresses nitrate, pesticide and salinity

reduction in shallow groundwater. This project also addresses Management Measures from Plans for California's NPS Pollution Control Program for Agriculture including erosion and sediment control and education and outreach.

Support for local decision makers

This project provides information on erosion control techniques suitable for this area, as determined by ease of management, cost and efficacy in controlling erosion. Information obtained from the project in Plymouth will be distributed throughout Amador County for use by other grape-growers of the region. The information obtained will be further distributed to other areas such as El Dorado County through the Farm Advisor, and to other areas through CAWG. By providing information on cost, efficacy, ease of management, and general satisfaction with the different erosion control strategies utilized in the project, local grape growers and others will be able to make informed choices on whether to implement erosion control, and if so, with what technique. In addition, the involvement of Cooperative Extension, the Farm Bureau and the County leads to even greater potential for information transfer, enabling better choices by more individuals. Thus, this project provides support for local decision makers.

Technology transfer:

The ACWGGA has established contacts with CAWG, the Mokelumne- Cosumnes Watershed Alliance, the Cosumne River Task Force, the Foothill Conservancy, and Cooperative Extension, the RCD, Amador Water Agency and Amador County Board of Supervisors, and any CALFED agencies interested. Project results will be provided to all of these entities. By better understanding erosion processes specific to the foothill region, the erosion control practices which are most effective in the region, and the impact of implementing these practices on local waters, greater knowledge is provided on mechanisms for protecting our watersheds.

Furthermore, the information obtained will be disseminated by providing workshops for community members and writing news releases in local and statewide publications. Thus individuals beyond the scope of the project will become aware of the project and its conclusions, and will be enabled to better judge for themselves the value of, and means to protect the watershed.

PART C – PROPOSED SCOPE OF WORK

1. BACKGROUND AND GOALS

   Population pressure and interest in planting new vineyards will lead to increased runoff and erosion potential in the rural areas around the City of Plymouth. Vineyards are known to experience serious erosion when erosion control measures are not implemented. None-the-less, none of the watershed projects listed by the California Ecological Restoration Project or the Watershed Project inventory that have been conducted in Amador County have involved erosion control. Most have focused on creating defensible space, while some have looked at contaminants in rivers and creation of recreational space. Investigation and implementation of erosion control in this area will go far in improving water quality and mitigating any negative impacts associated with grape growing in the area.

   This year (2002) marks the end of agricultural exemptions from pollution controls measures, including runoff and erosion control. As a result, greater focus will be placed on determining the best strategies for controlling runoff and preventing pollution from entering water bodies. Allowing grape growers to select and investigate the erosion control measures of their choice will promote more effective implementation of runoff and erosion control measures in the future, and promote proactive solutions to environmental concerns. Promoting grape-grower involvement in the demonstration of erosion control efficacy will supply the grower with accurate information ensuring that information passed on to neighbors and friends is correct. Furthermore, including local grape growers in decision-making will encourage continued dedication to controlling erosion and runoff, and protecting the watershed in general.

   The goals of this project are to reduce erosion and runoff from vineyards, determine the most effective erosion control strategies for the area and involve grape growers and other community members in watershed protection. These goals will be accomplished through education, implementation of erosion control strategies, scientifically sound monitoring, community outreach and ongoing discussions.

2. PROPOSED WORK TO BE PERFORMED (Starting with Task 4.)

TASK 4 Selection of Sites and Erosion Control Strategies

Selection of sites and erosion control strategies through presentations, discussion and site walk-throughs.

4.1 Preliminary meeting/workshop

Conduct a preliminary meeting/workshop to provide project overview, the watershed concept of resource management, introduce erosion control and possible strategies, and general discussion.

4.2 Site selection and erosion control strategies

Determine specific project locations on properties of project participants and the erosion control strategies to be used on each site through meeting with individual site owners.

Task 4 Deliverables

Preliminary meeting agenda (4.1), 12-15 sites and 3 erosion control strategies for the project (4.2).

TASK 5 Site Assessments

Each site selected for the project will be assessed and surveyed for baseline conditions.

Task 5.1 Soil testing

Sample soils from all project locations to determine soil type. Where soil type data is available, that data will be used. This information will be used in predicting runoff potential based on soil texture, organic content, structure and permeability, and aid in determining a strategy of erosion control for that site (eg, increasing organic matter in an inorganic soil).

Task 5.2 Site survey

Survey each site to determine the slope and position relative to creeks and drainages. These numbers will be used in the Universal Soil Loss Equation and rationale method for estimating run off and soil loss potential. This information will be compared with observed runoff and soil loss.

Task 5.3 Owner/manager interviews

Interview each owner and/or vineyard manager for each site to determine what additives are being used. This information will guide refinement of water quality constituents to be measured, and to estimate what contaminants might be expected in the runoff. Owners/managers will also be asked about soil management practices, timing of mulching, irrigation, fertilization, pesticide application etc.. Information will be obtained regarding the method of determining fertilization needs, and requirements from the perspective of a wine maker.

Task 5.4 Erosion potential

Utilize rainfall simulations to determine runoff and erosion potential for five locations in each site. Rainfall simulation tests will be conducted for 30 minutes, runoff volume collected, and analyzed for nutrients (total nitrogen, nitrate, phosphorous), dissolved oxygen, TS, TDS, pH, and TOC and others that become evident based on interview results. In addition measurements on infiltration, and sediment load will be taken. These tests will be conducted prior to implementing erosion control measures.

Task 5.5 Data compilation

All data generated during the site assessments will be compiled into a report for each project location. That report will be made available to each site owner for review and information.

Task 5 Deliverables

Results of soil tests, site surveys, interviews and erosion potential tests compiled into a data file for each project location (5.5).

TASK 6 Workshops

Workshops will take place throughout the project duration to provide continuing education, project progress, discussion and sustainability assessments.

Task 6.1 Continuing Education

Conduct continuing education workshops twice per year (or more frequently as demand indicates) for project participants and other interested parties. Information on erosion control and other watershed protection actions will be presented. In addition, when possible, the workshops will incorporate field trips to nearby vineyards or areas of obvious erosion. The date of each workshop will be determined in conjunction with project participant input.

Task 6.2 Progress and discussion

Conduct quarterly progress meetings with project participants to provide an open forum for discussion, and to update participants of progress. Opportunity will be presented for each participant to voice concerns, share successes and discuss costs etc. associated with the methods they have selected. Dates and agendas will be specified in conjunction with participant input.

Task 6.3 Pamphlet development

Develop a brief pamphlet describing the project and its results. Included in the pamphlet will be information on erosion control efficacy, ease of management, costs and site owner satisfaction. This pamphlet will be made available for grape growers and other interested parties.

Task 6.4 Sustainability Assessments

Conduct periodic sustainability "self assessment" workshops for grape growers and other interested parties in cooperation with CAWG. These workshops will be conducted periodically and will assist growers in understanding what measures can be taken to ensure sustainable vineyard management. Participants will be asked to provide feedback for these workshops. Workshop dates will be determined through discussion with project participants and other interested parties.

Task 6 Deliverables

Workshop schedule and agendas (6.1), progress meeting agendas and dates (6.2), erosion control pamphlet (6.3) and sustainability workshop dates and agendas, and feedback (6.4).

TASK 7 Project Implementation

Erosion control measures will be implemented in accordance with Best Management Practices for each strategy utilized. Possible activities will include: seeding, cessation of herbicide application, etc.

Task 7.1 Erosion control strategy implementation

Implement erosion control strategies following BMPs for each strategy utilized.

Task 7 Deliverables

Erosion control strategies implemented and BMPs provided (7.1)

TASK 8 Monitoring

All aspects of the project will be monitored to document and determine project success and efficacy.

Task 8.1 Erosion potential

Monitor erosion control potential using rainfall simulation after erosion control measures have been implemented. Initial rainfall simulation tests are part of the site assessments. After erosion control measures have established (cover crops grown in, etc), rainfall simulation tests will be conducted at the same locations as the initial tests and occur twice for each location. Each site will have three test locations such that 60 specific locations will be tested and 3 tests will be completed for each location (one initial and two follow-up). Approximately 15 samples of runoff are anticipated for each test. Measurements of water quality constituent concentrations, sediment volume, runoff volume and infiltration depths will occur for each site.

Task 8.2 Stream water quality and stage

Collect water quality samples above and below each project location during two storm events before and after erosion control measures are installed. Samples will betaken prior to peak flow, at peak flow and as the peak descends. Stream stage measurements will be taken using a staff gage above the project area, and/or located above and below each project location depending on the site owner's ability to conduct sampling. Record height of peak flow and peak volume for each event will be measured as well. Water Quality samples will be analyzed for nutrients (total nitrogen, nitrate, phosphorous), dissolved oxygen, TS, TDS, pH, and TOC and others that become evident based on interview results. Four events will be monitored for each site, above and below the site. Samples will be taken in triplicate.

Task 8.3 Shallow groundwater quality

Install and monitor shallow groundwater monitoring wells above and below each project site, the locations will be determined based on consultation with a local geologist. Monitoring wells will be installed prior to implementing erosion control methods. Thereafter, water quality samples will be taken quarterly at each location. Water quality samples will be analyzed for nitrate, phosphate,

dissolved oxygen, TDS, pH, and TOC and others that are revealed in interviews. Two initial then quarterly samples for two years subsequently will be taken at 2 locations at each site, in duplicate.

Task 8.4 Photo-monitoring

Take photographs of each project site before and after erosion control implementation, and during at least one rainfall simulation test. Photographs will also be taken to document installation of groundwater monitoring wells and stream gauging locations.

Task 8.5 Data compilation

Compile all data generated in during monitoring into a single file for each project site on a quarterly basis. These data files will be made available to each site owner/manager, and the general information will be available for general discussion during progress meetings.

Task 8 Deliverables

Erosion control potential tests, stream water quality and stage monitoring,and shallow groundwater monitoring results compilation (8.5). Photographs documenting project implementation (8.4).

TASK 9 Outreach

Workshops for the general public and for schools will be held to further public understanding of the importance of watershed health and the function and performance of erosion control measures to mitigate impacts to water quality and the environment caused by vineyard runoff. Periodic news releases will advertise the workshops, and provide information regarding project progress. Finally, articles will be published in professional (peer reviewed) and lay (agricultural practice) publications as part of outreach.

Task 9.1 Workshop Schedule and Syllabus

Determine dates for community outreach workshops and prepare a description detailing the subjects to be discussed.

Task 9.2 School presentations

Implement an annual presentation schedule for the local school districts. Develop a syllabus or lesson plan to be used in schools during the presentation, and for follow up by the teacher following presentations.

Task 9.3 Public Notification

Communicate project activities to community and land-owners and notify the local newspapers and schools of the workshop schedules and agendas.

Task 9.4 Publications

Publish the project approach, details, and monitoring results in at least one peer-reviewed journal and several lay journals and news releases. Additionally, work with local newspapers and media outlets to develop at least three special features on the project. These publications and special features will serve to increase the body of scientific knowledge and communicate ideas regarding the performance of erosion control measures.

Task 9.5: Survey Questionnaire

Develop a survey questionnaire to evaluate the knowledge gained by the workshop and project participants as well as evaluate their feedback so that improvements can be implemented.

Task 9 Deliverables

Workshop syllabus and schedule (9.1), school presentation schedule and plans (9.2), public notification articles and letters (9.3), publications (9.4), and survey questionnaire (9.5).

3. TARGET COMPLETION DATES

Task No. Deliverables	Target Completion Dates
Task 1: Project Administration	
1.2 Quarterly/Monthly Progress Reports	Aug 10/October 1 ,2003 monthly/quarterly thereafter
1.5 Contract Summary Form	Octg.1, 2003 or 90 days following contract execution
1.6 List of subcontracted tasks, Good Faith Effort documents, quarterly/monthly Utilization Reports	Aug 15 2003/Oct. 15 and monthly/quarterly thereafter
1.7 Subcontractor Documentation	Sept.1, 2003, or 60 days following contract execution
1.8 Expenditure/Invoice Projections	Aug 15, 2003 monthly thereafter
1.9 Project Survey Form	Jan 2006
Task 2: CEQA/NEPA Documents and Permits	
2.1 CEQA/NEPA Documentation	Oct 1, 2003 or 90 days following contract execution
2.2 Permits	Nov. 1, 2003 or 120 days following contract execution
Task 3: Quality Assurance Project	
SAP and QAPP	Oct 1, 2003 or 90 days following contract execution
Task 4: Selection of Sites and Erosion Control Strategies	
4.1 Preliminary meeting/workshop agenda and date	Aug 1, 2003 or 30 days following contract execution
4.2 Site selection and erosion control strategies	Feb 15, 2004
Task 5: Site Assessments	
5.5 Data file for assessment results	June 15, 2004
Task 6: Workshops	
6.1 Continuing education workshop agendas and dates	Nov. 1, 2003 or 120 days following contract execution, and annually thereafter.
6.2 Progress meetings agendas and dates	Nov. 1, 2003 or 120 days following contract execution, and annually thereafter.
6.3 Erosion control pamphlet	Nov 1 2005
6.4 sustainability assessment agendas, dates and feedback	Nov. 1, 2003 or 120 days following contract execution, and annually thereafter.
Task 7: Erosion control implementation	
7.1 BMPs for each strategy	March 15, 2004 (implementation to take place April through June, 2004)
Task 8: Monitoring	
8.4 Photo documentation of project implementation	Sept. 1, 2004 or 90 days following implementation
8.5 Monitoring data compilation	Sept. 1, 2004 Sept. 1, 2005 and Feb 1, 2006.
Task 9: Outreach	
9.1 Workshop Schedule and Syllabus	Dec. 1, 2003 or 150 days following contract execution, and annually thereafter.
9.2 School presentation schedule and lesson plans	Dec. 1, 2003 or 150 days following contract execution, and annually thereafter
9.3 Public notification articles and letters	Dec. 1, 2003 or 150 days following contract execution, and annually thereafter
9.4 Publications	Sept 1, 2005
9.5 Survey Questionnaire	Sept 1, 2005
Task 10: Draft and Final Reports	
10.1 Draft Report	Nov 1, 2005
10.2 Final Report	Feb 1, 2006

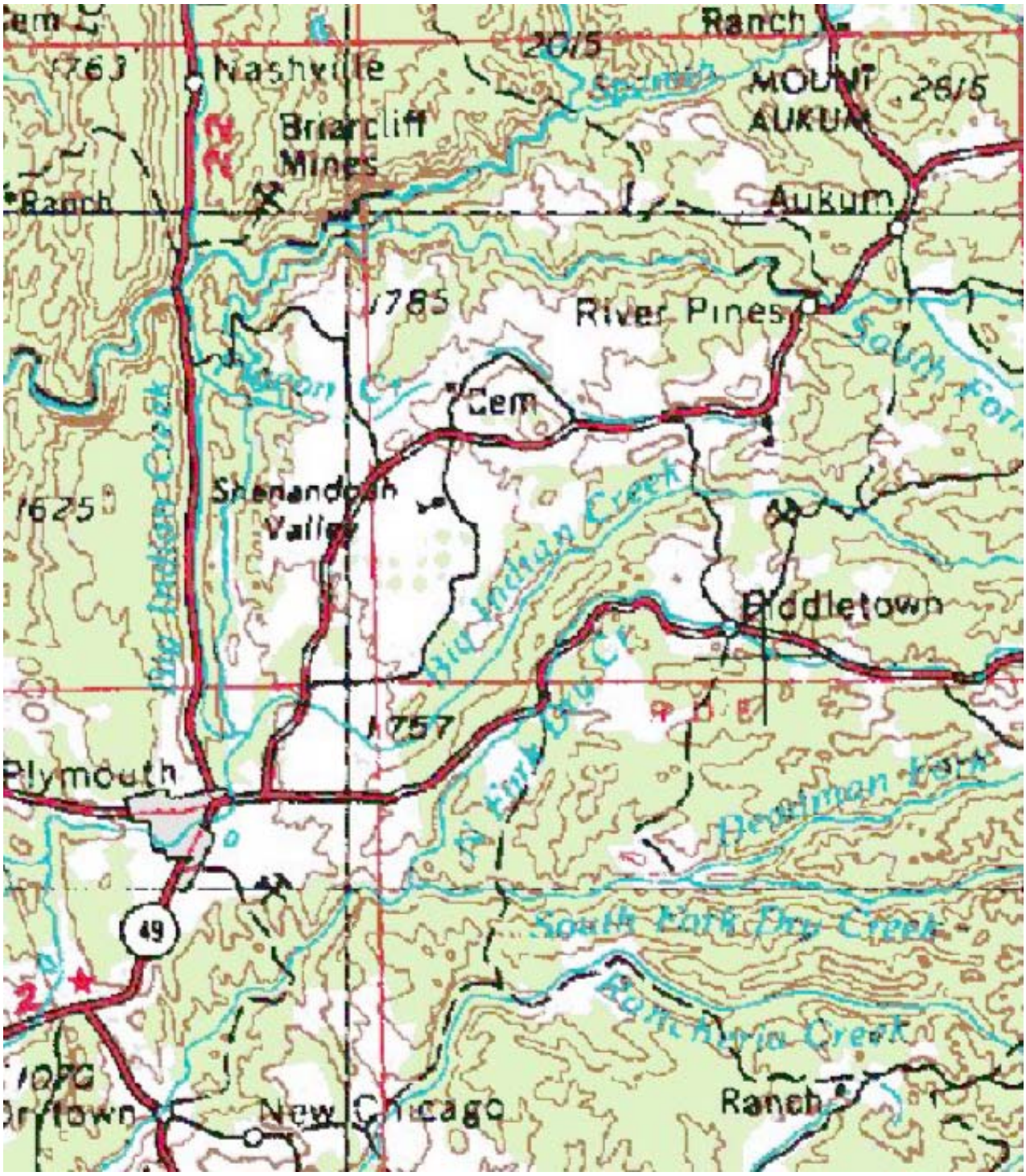
PART D1 - BUDGET SUMMARY SHEET – TASK BUDGET BREAKDOWN

	Proposition 13 Funds	Other Project Funds	Total Budget
1. Task 1 – Project Administration	**$50,000**	$	**$50,000**
2. Task 2 – CEQA/NEPA Documents and Permits	**$3,000**		**$3,000**
2.1 CEQA notice of exemption	*$500*		*$500*
2.2 Well permitting	*$2,500*		*$2,500*
3. Task 3 – Quality Assurance Project Plan	**$3,000**		**$3,000**
4. **Task 4 – Site and erosion control strategy selection**	**$10,000**		**$10,000**
4.1 Preliminary meeting	*$3,000*		*$3,000*
4.2 Individual meetings	*$7,000*		*$7,000*
5. Task 5 – Site Assessments (total)	**$84,000**		**$84,000**
5.1 Soil Tests	*$6,000*		*$6,000*
5.2 Site surveys	*$15,000*		*$15,000*
5.3 Interviews	*$5,000*		*$5,000*
5.4 Erosion potential	*$55,000*		*$55,000*
5.5 Data compilations	*$3,000*		*$3,000*
6. Task 6 –Workshops (total)	**$35,000**		**$35,000**
6.1 Continuing education	$16,000		$16,000
6.2 Progress meetings	$7,000		$7,000
6.3 Pamphlet preparation	$2,000		$2,000
6.4 Sustainability assessments	$10,000		$10,000
7. Task 7 – Erosion Control Implementation	**$75,000**		**$75,000**
8. Task 8 – Monitoring	**$205,000**		**$205,000**
8.1 Erosion potential	*$64,000*		*$64,000*
8.2 Stream Water Quality and Stage	*$30,000*		*$30,000*
8.3 Shallow Groundwater	*$105,000*		*$105,000*
8.4 Photo-monitoring	*$10,500*		*$10,500*
8.5 Data compilation	*$5,000*		*$5,000*
9. Task 9 – Outreach	**$30,000**		**$30,000**
9.1 Workshop Schedule and syllabus	*$1,000*		*$1,000*
9.2 School presentation and lesson plan	*$6,000*		*$6,000*
9.3 Public notifications	*$3,000*		*$3,000*
9.4 Publications	*$18,000*		*$18,000*
9.5 Survey questionaire	*$2,000*		*$2,000*
10. Task 10 -- Draft and Final Reports	**$5,000**		**$5,000**
TOTAL BUDGET	**$500,000**		**$500,000**

PART D2 - BUDGET SUMMARY SHEET – LINE ITEM Budget

	Proposition 13 Funds	Other Project Funds	Total Budget
1. Personnel Services	$40,000	$	$40,000
2. Operating Expenses	$10,000		$10,000
3. Property Acquisitions			
a. Equipment	$11,000		$11,000
b. Furniture			
c. Portable assets			
d. Electronic data software/hardware			
e. Processing equipment			
f. Miscellaneous			
4. Professional and Consultant Services	$114,000		$114,000
5. Contract Laboratory Services	$120,000		$120,000
6. Construction Expenses	$180,000		$180,000
7. General Overhead	$25,000		$25,000
8. TOTAL BUDGET	$500,000		$500,000

PART E – PROJECT MAP



PART F – ENVIRONMENTAL INFORMATION FORM (3 pages maximum)

ENVIRONMENTAL INFORMATION FORM

NEPA/CEQA

1. Will this project require compliance with CEQA, NEPA, or both? Yes__x___No_____

2. If you checked "no" to question 1, please explain why compliance is not required for the actions in this proposal.

3. If the project will require CEQA and/or NEPA compliance, identify the lead agency(ies).

CEQA Lead Agency	Amador County, or Central Valley Regional Water Quality Control Board
NEPA Lead Agency	

4. Please check which type of document will be prepared.

CEQA		NEPA	
Categorical Exemption	X	Categorical Exclusion	
Initial Study		Environmental Assessment/FONSI	
Environmental Impact Report		Environment Impact Statement	

Categorical exemption expectation based on section 15306, information collection from rainfall simulation and section 15304, minor alterations to land.

5. If the CEQA/NEPA process is not complete, please describe the estimated timelines and cost for the process and the expected date of completion.

All paperwork will be prepared and submitted within 60 days of contract execution. We anticipate acceptance of the exemption after the 35 day comment period.

6. If the CEQA/NEPA document has been completed:

What is the name of the document?_____

Please attach a copy of the CEQA/NEPA document cover page to the application.

Please indicate what permits or other approvals may be required for the activities contained in your proposal and which have already been obtained. Please check all that apply.

LOCAL PERMITS AND APPROVALS	Needed?	Obtained?
Conditional use permit	No	
Variance	No	
Subdivision Map Act	No	
Grading permit	No	
General plan or Local Coastal Program amendment	No	
Specific plan approval	No	
Rezone	No	
Williamson Act Contract cancellation	No	
Local Coastal Development Permit	No	
Other A county well permit from Environmental Health will be required for the installation of the shallow groundwater monitoring wells.	Yes	No
STATE PERMITS AND APPROVALS	Needed?	Obtained?
Scientific collecting permit	No	
CESA compliance: 2081	No	
CESA compliance: NCCP	No	
1601/03	No	
CWA 401 certification	No	
Coastal development permit	No	
Reclamation Board approval	No	

Notification of DPC or BCDC	No	
Other		
FEDERAL PERMITS AND APPROVALS	Needed?	Obtained?
ESA compliance Section 7 consultation	No	
ESA compliance Section 10 permit	No	
Rivers and Harbors Act	No	
CWA 404	No	
Other		
PERMISSION TO ACCESS PROPERTY		
Permission to access city, county or other local agency land. If "yes," indicate the name of the agency: _____	No	
Permission to access State land. If "yes," indicate the name of the agency: _____	No	
Permission to access federal land. If "yes," indicate the name of the agency: _____	No	
Permission to access private land. If "yes," indicate the name of the landowner (if multiple landowners, indicate how many individuals will be involved and what percentage have already granted permission)_Meetings will occur and permission granted for participating vineyards and other agricultural lands. 15 land owners are expected to participate. 40% have agreed at this time.	Yes	No

PART G – LAND USE QUESTIONNAIRE (2 pages maximum)

PART - LAND USE QUESTIONNAIRE

1. Do the actions in the proposal involve construction or physical changes in the land use? Yes____ No_X__

The project proposes research and planning of erosion control methods as well as the implementation of the erosion control methods, however the land use (agricultural) of the area will not be altered.

2. How many acres of land will be subject to a land use change under the proposal? _none____(15 acres will be included in the project, but land use will not change)

3. What is the current land use of the area subject to a land use change under the proposal? What is the current zoning and general plan designation(s) for the property? Does the current land use involve agricultural production?

   a) Current land use _____Agricultural Production_____
   b) Current zoning _____Agriculture_____
   c) Current general plan designation _____Williamson Act_____
   d) Does current use involve agricultural production? Yes_x___ No____

4. Is the land subject to a land use change in the proposal currently under a Williamson Act contract?
   Yes__ __ No _X__
   No land use change is proposed under this project.

5. What is the proposed land use of the area subject to a land use change under the proposal?

6. Will the applicant acquire any land under the proposal, either in fee (purchase) or through a conservation easement? Yes_____ No__X___

   a) If you answered "yes" to 6, describe the number of acres that will be acquired and whether the acquisition will be of fee title or a conservation easement:
   b) Total number of acres to be acquired under proposal
      _____
   c) Number of acres to be acquired in fee
      _____
   d) Number of acres to be subject to conservation easement
      _____

7. For all lands subject to a land use change under the proposal, describe what entity or organization will manage the property and provide operations and maintenance services.

8. Will the applicant require access across public or private property that the applicant does not own to accomplish the activities in the proposal? Yes___x__ No_____

9. For land acquisitions (fee title or easements), will existing water rights be acquired? Yes_____ No__x___

10. Does the applicant propose any modifications to the water right or change in the delivery of the water?
Yes_____ No__x__

PART H – SUPPORTING DOCUMENTATION (10 pages maximum)

The following documents are included to support this proposal.

- Example Letter of notification and recipient list
- Letter from Amador County Board of supervisors indicating their support and cooperation.
- Letter from Amador County Farm Bureau indicating their support and cooperation.
- Letter from Cooperative Extension indicating support and cooperation.
- Cover pages from articles describing the use of rainfall simulation in evaluating runoff and erosion from vineyards.